NextGen Housing:

INDUSTRIAL CONSTRUCTION

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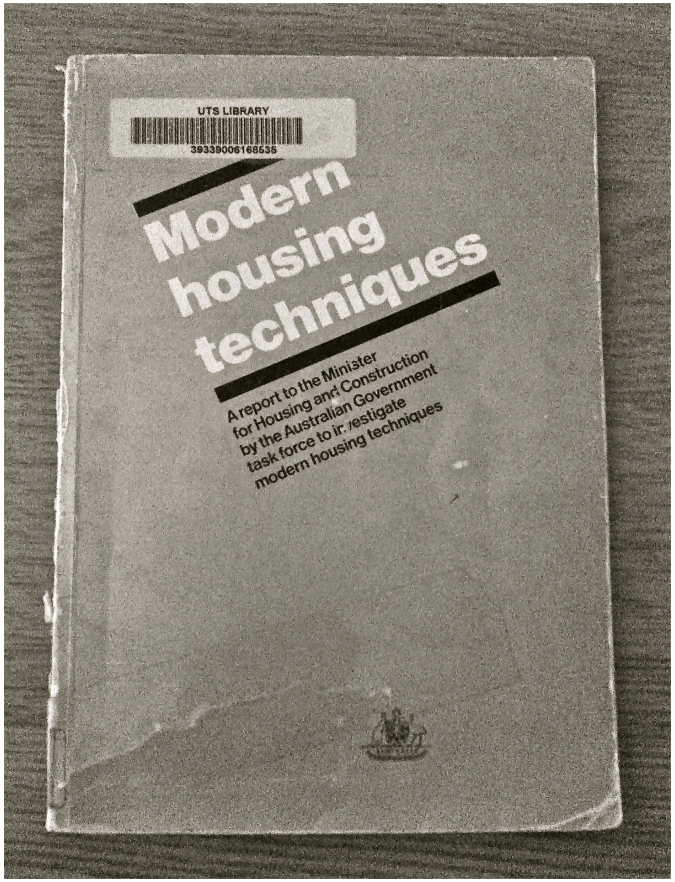
1. INTRODUCTION

Prefab, modular, manufactured and panelized are terms that are used pretty loosely to describe various types of industrial construction. They all have one thing in common and that is its pre-assemblage capabilities before they are delivered to the site.

In Australia, the majority of houses are still built in traditional materials by conventional methods of construction. In other spheres of building, industrialized processes are being used with much greater success than in the housing industry. For example, in multi-story office blocks and schools, consisting as they do of many repetitive elements, it has been possible to utilise the production line process more effectively than in the case of the individual house on its own block of land with bricks, windows, screws and cement.

According to the ‘Modern housing techniques: report to the Minister for Housing and Construction’ by Ray Burkitt, the author states that ‘Industrialized construction means maximum economic use of factory production, maximum mechanisation both on and off the site and the fullest application of modern techniques of volume production.’ (Burkitt 1974, p.19)

In order to understand this reasoning, we will present to you types of housing techniques in Australia along with case studies and reasons for and against industrial construction.



Text used for the Research Chapter on Industrial Construction.
Burkitt, R. 1974, ‘Modern housing techniques: report to the Minister for Housing and Construction’, Canberra: Australian Government Publishing Service.

2. BRIEF HISTORY

A glimpse into the history of prefabricated housing over the last century reveals a wealth of practical and attractive alternatives to its current form.

1830s

- The first prefabricated cast-iron house was completed in England in 1830.

1840s

- By 1840s, foundries in England and US were producing components for metal housing
- Precut wooden and panel House kits provided temporary housing for miners during California gold rush of 1849.

1900s

- During the 19th century, the business of making building components that could be assembled on a remote site developed into a substantial industry known since the 1930s as prefab. Prefab structures would come to include hospitals, schools etc.

1900-1940s

- At the turn of 20th century, the existence of these materials as well as improved methods of transportation made it possible for thousands of middle class Americans to become homeowners by ordering a house from a catalogue.
- Between 1908-1940, namely Sears, Roebuck and Co, is the name most people associate with mail-order homes.
- The devastation of WW1 an the surplus of steel that followed its end led European architects to prefabricate systems of concrete and steel for housing developments and single family residences.

1914

- In 1914, French architect Le Corbusier with Max Dubois, designed the Domino house. Domino's serially reproducible units introduce greater horizontal spatial freedom (the free plan) achieved via pilotis (thin structural columns) and non-load-bearing walls freely arranged as spatial dividers.
- Le Corbusier's vision of a new era of mass-produced homes that would do away with "dead concepts in regard to the house" helped to inspire the International Style of architecture, which in turn shaped modern building design throughout the rest of the 20th and 21st century.

1923

- In 1923, Walter Gropius with Adolf Meyer developed a 'building block' system of standardized flat roofed housing.
- This was introduced to the US through an exhibition, which was to influence architects for decades to come about prefabricated housing. Unfortunately it had little immediate effect on the style of mass-produced housing in the US.

1931

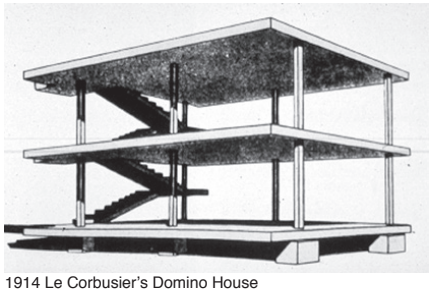
- Albert Frey's 1931 Aluminaire House, the first house in America built entirely of light steel and aluminium. Frey, who worked for and was inspired by Le Corbusier's vision.

1932

- General Homes Corp. founded by Howard Fisher in 1932 modeled its method of constructing homes on the way General Motors produced cars.
- The Great Depression took its toll on the housing industry and more American companies began to experiment with prefab in order to produce affordable housing.

1930s-1940s

- Mid 1930s-1940s Frank Lloyd Wright created the Usonian House, which was built with a grid system for maximum flexibility. Repeating standard details cut costs.
- The WW2 created such a dramatic housing shortage that saw the US government to develop and support prefab housing.



1914 Le Corbusier's Domino House

1923 Walter Gropius' 'Building Block' system

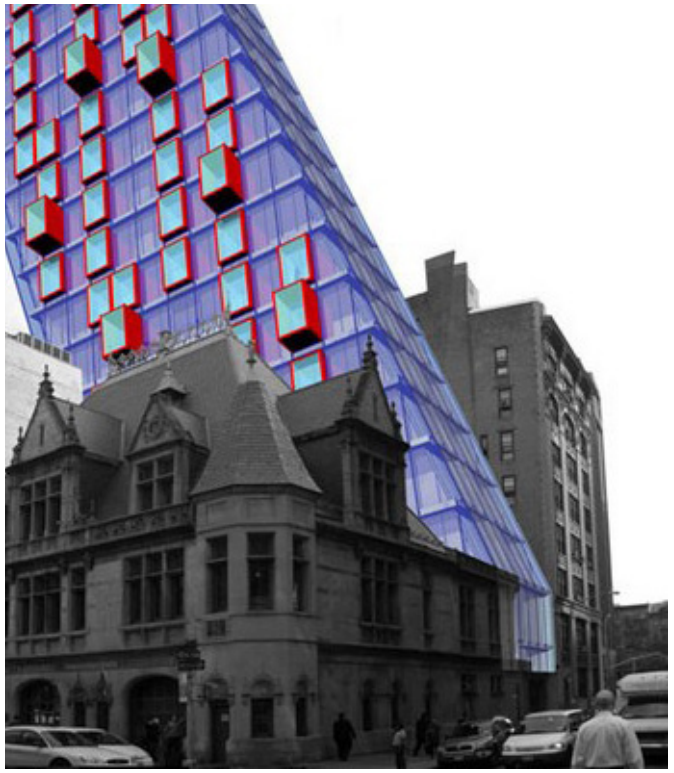
10. INSIGHTS AND OBSERVATIONS

Industrial construction has come along way over the last 50 years due to many factors including war, advancements in building materials and technology, social acceptance and diversity, financial stability and the environmental climate. Each of these factors has been a driving force in the shaping the future of industrial construction.

Prefab has the stigma for being cheap, ugly and poorly constructed structures. However, after looking at some of the case studies, it shows that prefab can be functional and aesthetically appealing. For example the Shipping Container Housing concept by Group 41 utilises used and discarded shipping containers as medium density housing. It transformed the shipping containers into functional and unique apartment blocks that in turn vitalises the existing community. This sort of uniqueness and mystery

There is also a social responsibility for prefab housing units to create an interesting and vibrant environment for people to live in. It is no longer acceptable to just build ordinary ugly buildings under the argument that their trying to save money, these examples prove that not only is it definitely possible to create quality affordable housing but some of the solutions are extremely aesthetical as well as solve ethical, environmental, financial and social problems at the same time.

Another insight is the lifecycle and sustainability of prefab housing units. One would question the handling and disposal of prefab housing units. However it seems relevant that the materials used in each case study were recyclable. For instance, concrete modules in the Nakagin Capsule Tower, can be reused either as road base or gravel.



Source: http://www.archisage.net/forum/topics/shipping-containers-and

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